MATERIAL SAFETY DATA SHEET

BAYER CORPORATION
AGRICULTURE DIVISION
P.O. Box 4913 Hawthorn Road
Kansas City, MO 64120-0013

TRANSPORTATION EMERGENCY
CALL CHEMTREC: 800-424-9300
INTERNATIONAL: 703-527-3887

NON-TRANSPORTATION
BAYER EMERGENCY PHONE...: (800) 414-0244
BAYER INFORMATION PHONE.: (800) 842-8020

1. CHEMICAL PRODUCT IDENTIFICATION:

PRODUCT NAME.....: BAYER AL Powerforce Kills Bugs Fast Multi-Insect Killer Ready-To-Spread Granules
PRODUCT CODE.....: 41000
CHEMICAL FAMILY.....: Pyrethroid Insecticide
CHEMICAL NAME.....: Cyano(4-fluoro-3-phenoxyphenyl)methyl 3-(2,2-dichloroethenyl)-2,2-dimethylcyclopropanecarboxylate
SYNONYMS.....: Cyfluthrin
PRODUCT USE.....: Consumer Insecticide

2. COMPOSITION/INFORMATION ON INGREDIENTS:

INGREDIENT NAME /CAS NUMBER	EXPOSURE LIMITS	CONCENTRATION (%)
***** HAZARDOUS INGREDIENTS *****		
Cyfluthrin 68359-37-5	OSHA : Not Established ACGIH: Not Established	0.1 %
Ammonium sulfate 7783-20-2	OSHA : Not Established ACGIH: Not Established	99-99.5 %

3. HAZARDS IDENTIFICATION:

****
* EMERGENCY OVERVIEW *
* *
* CAUTION! Color: Off-white; Form: Solid; Granules; Odor: *
* None; Harmful if inhaled or ingested; Causes eye irritation. *
****

POTENTIAL HEALTH EFFECTS:

ROUTE(S) OF ENTRY.....: Inhalation; Skin Contact; Eye Contact

HUMAN EFFECTS AND SYMPTOMS OF OVEREXPOSURE:

ACUTE EFFECTS OF EXPOSURE.....: Exposure during the labeled use of this product is expected to be minimal. Consumers should refer to the packaging label for proper handling procedures. Sufficient exposure to cyfluthin, the active ingredient in this product, may cause eye and skin irritation characterized by redness or itching. In addition, sufficient exposure to cyfluthrin may produce paraesthesia (a tingling or burning sensation on the surface of the skin). This is a frequently reported symptom associated with sufficient dermal exposure to alpha-cyano (or Type II) synthetic pyrethroids and normally subsides without treatment within 24 hours. The onset of these symptoms usually occurs 2-12 hours after exposure. Mucous membrane irritation involving the nose, throat and upper respiratory tract may occur from inhalation of aerosols containing cyfluthrin. The primary component of this product, ammonium sulfate, can be irritating to the eyes, skin and respiratory tract.

CHRONIC EFFECTS OF EXPOSURE...: Based on animal studies, no adverse effects are expected from chronic exposure to this product.

CARCINOGENICITY.....: This product is not listed by NTP, IARC or regulated as a carcinogen by OSHA.

MEDICAL CONDITIONS

AGGRAVATED BY EXPOSURE.....: No specific medical conditions are known which may be aggravated by exposure to the active ingredient in this product. As with all materials which can cause upper respiratory tract irritation, persons with a history of asthma, emphysema, or hyperreactive airways disease may be more susceptible to a response at low concentration.

4. FIRST AID MEASURES:

FIRST AID FOR EYES.....: Hold eyelids open and flush with plenty of water for 15 minutes. Call a physician if irritation develops or persists.

4. FIRST AID MEASURES (Continued)

FIRST AID FOR SKIN.....: Wash skin immediately with soap and warm water. Get medical attention if irritation develops or persists.

FIRST AID FOR INHALATION: If a person is overcome by excessive exposures to this material, remove to fresh air or uncontaminated area. If not breathing, give artificial respiration, preferably mouth-to-mouth. Get medical attention as soon as possible.

FIRST AID FOR INGESTION.: If ingestion is suspected, call a physician or poison control center. Drink one or two glasses of water and induce vomiting by touching back of throat with finger, or, if available, by administering syrup of ipecac. If syrup of ipecac is available, administer 1 tablespoonful (15 mL) of syrup of ipecac followed by 1 to 2 glasses of water. If vomiting does not occur within 20 minutes, repeat the dose once. Do not induce vomiting or give anything by mouth to an unconscious person.

NOTE TO PHYSICIAN.....: Treat the patient symptomatically. Published data indicate vitamin E acetate can prevent and/or mitigate symptoms of paresthesia caused by synthetic pyrethroids.

5. FIRE FIGHTING MEASURES:

FLASH POINT.....: Not Applicable

EXTINGUISHING MEDIA.....: Water; Dry Chemical

SPECIAL FIRE FIGHTING PROCEDURES: Keep out of smoke. Cool exposed containers with water spray. Fight fire from upwind position. Use self-contained breathing equipment. Contain runoff by diking to prevent entry into sewers or waterways. Equipment or materials involved in pesticide fires may become contaminated. Regarding ammonium sulfate, temperatures above 282 C (540 F) will cause decomposition with release of ammonia and sulfur trioxide.

6. ACCIDENTAL RELEASE MEASURES:

SPILL OR LEAK PROCEDURES.....: Isolate area. Avoid breathing dusts and skin contact. Use recommended protective equipment while carefully sweeping up and place in covered container for re-use if possible. Scrub contaminated area with soap and water. Repeat and rinse with water. Prevent contamination of streams, sewers, or other waterways.

7. HANDLING AND STORAGE:

STORAGE TEMPERATURE(MIN/MAX): None/30 day average not to exceed 38 C (100 F).

SHELF LIFE.....: Not established

SPECIAL SENSITIVITY.....: Not established

Continued on next page

7. HANDLING AND STORAGE (Continued)

HANDLING/STORAGE PRECAUTIONS: Do not allow product to contaminate material which is intended for use or consumption by humans or animals.

8. PERSONAL PROTECTION:

REQUIRED WORK/HYGIENE PROCEDURES...: Exposure during the labled use of this product is expected to be minimal. Consumers should refer to the packaging label for proper handling procedures. However, if exposure to this product is possible while handling large quantities such as in subsequent manufacturing, transportation spills or other emergencies, the following personal protection is recommended.
EYE PROTECTION REQUIREMENTS.....: Goggles
SKIN PROTECTION REQUIREMENTS.....: Long sleeves and trousers
HAND PROTECTION REQUIREMENTS.....: Chemical-resistant gloves such as latex or nitrile
VENTILATION REQUIREMENTS.....: Control exposures through the use of general and local exhaust ventilation.
RESPIRATOR REQUIREMENTS.....: If needed, based on the conditions of use, wear a NIOSH-approved respirator for dusts and mists.
ADDITIONAL PROTECTIVE MEASURES.....: Clean water and soap should be available for washing in case of eye or skin contamination. Educate and train employees in safe use of the product. Follow all label instructions. Launder clothing after use. Wash thoroughly after handling.

9. PHYSICAL AND CHEMICAL PROPERTIES:

PHYSICAL FORM.....: Solid
APPEARANCE.....: Granules
COLOR.....: Off-white
ODOR.....: None
MOLECULAR WEIGHT.....: 434.3 (for cyfluthrin)
BOILING POINT.....: Not applicable
MELTING/FREEZING POINT....: Not applicable
SOLUBILITY IN WATER .....: 2 ppb (for cyfluthrin)
SPECIFIC GRAVITY .....: Not applicable
BULK DENSITY.....: 52-58 lb./cu. ft. (typical)
VAPOR PRESSURE .....: 7.2 x 10-9 mm Hg @ 20 C (for cyfluthrin)

10. STABILITY AND REACTIVITY:

STABILITY.....: This is a stable material.
HAZARDOUS POLYMERIZATION...: Will not occur.

10. STABILITY AND REACTIVITY (Continued)

INCOMPATIBILITIES.....: Alkaline or oxidizing media
INSTABILITY CONDITIONS.....: Not Noted
DECOMPOSITION PRODUCTS.....: For ammonium sulfate: ammonia, sulfur trioxide

11. TOXICOLOGICAL INFORMATION:

Only acute toxicity studies have been performed on this product as formulated. The non-acute information pertains to the active ingredient, cyfluthrin technical.

ACUTE TOXICITY
ORAL LD50.....: Male Rat: 2232 mg/kg; Female Rat: 1922 mg/kg
DERMAL LD50.....: Male & Female Rat: >5000 mg/kg
INHALATION LC50....: 4 HR Exposure to Dust: Male & Female Rat: >2.03 mg/L (actual); 1 HR Exposure to Dust (extrapolated from 4 HR LC50): Male & Female Rat: >8.12 mg/L (actual)
EYE EFFECTS.....: Rabbit: Moderate irritation was observed in the iris and conjunctiva with all irritation clearing within 7 days post-treatment.
SKIN EFFECTS.....: Rabbit: slight dermal irritant.
SENSITIZATION.....: Guinea pig: Not a dermal sensitizer.

SUBCHRONIC TOXICITY...: In a 3 week dermal toxicity study, cyfluthrin technical was administered to rats for 6 hours/day at dose levels of 100, 340 or 1000 mg/kg. Animals received a total of 17-18 applications in a period of 22-23 days. An additional control and high-dose group were treated and maintained for 14-15 days following treatment so as to ascertain the extent of recovery. Effects observed included reduced feed consumption, red nasal discharge, urine stains, and findings at the dose site (scabbing, crusty, discolored and raised zones). Histologically, epidermal and dermal alterations in treated skin were observed in animals of the mid- and high-dose groups. Similar, but slightly less severe microscopic alterations were also observed in the high-dose recovery group. The overall NOEL was 100 mg/kg. In a 13 week inhalation study, rats were exposed to cyfluthrin at aerosol concentrations of 0.09, 0.71 or 4.51 mg/m3 for 6 hours/day, 5 days/week. The NOEL was 0.09 mg/m3 based on reduced body weight gains.

CHRONIC TOXICITY.....: Cyfluthrin has been investigated in chronic feeding studies using two different strains of rats. In each study, cyfluthrin was administered for 2 years at dietary concentrations ranging from 50 to 450 ppm. Body weight gains were decreased at concentrations of 150 ppm or greater. Changes in clinical chemistries occurred at 450 ppm. In one of the studies, histopathology revealed a numerical increase in mammary gland adenocarcinomas at 450 ppm. This finding was not statistically significant when compared to the controls and is not considered to be compound-related. In each study, the overall NOEL was 50 ppm based on decreased body weight gains. In a 1 year feeding study, dogs were administered cyfluthrin at dietary concentrations of 50, 100, 360 or 650 ppm. Beginning on week 8, the high-dose was reduced to 500 ppm for the remainder of the study due to severe clinical neurological symptoms. Body weights were decreased for animals of the high-dose. Neurological findings (gait abnormalities and postural reaction deficits) were

observed at doses of 360 ppm and greater. The NOEL was 100 ppm.

CARCINOGENICITY.....: Cyfluthrin was investigated for carcinogenicity in chronic studies using several different strains of rats and mice. In rats, the maximum level tested was 450 ppm. Maximum levels tested in mice were 1400 and 1600 ppm for males and females, respectively. There was no evidence of a carcinogenic potential observed in any of the strains in either species.

MUTAGENICITY.....: Numerous in vitro and in vivo mutagenicity studies have been conducted on cyfluthrin, all of which are negative.

DEVELOPMENTAL TOXICITY: In developmental toxicity studies using rats, cyfluthrin was administered during gestation by oral gavage at doses ranging from 1 to 30 mg/kg. The overall NOEL from these studies for maternal toxicity was 3 mg/kg. No developmental effects were observed at any of the doses tested. In each study, the NOEL for developmental toxicity was equivalent to the highest dose tested. The NOELs for developmental toxicity for the initial study and the subsequent study were 30 and 10 mg/kg, respectively. Rabbits were administered cyfluthrin during gestation by oral gavage at doses ranging from 5 to 180 mg/kg. At maternally toxic levels, there was an increased incidence of post-implantation losses. The overall NOEL derived from these studies for both maternal and developmental toxicity was 20 mg/kg. In an inhalation study, rats were exposed during gestation to cyfluthrin at aerosol concentrations of 0.46, 2.55 or 11.9 mg/m3 for 6 hours/day. NOELs for maternal and developmental toxicity were less than 0.46 and 0.46 mg/m3, respectively.

REPRODUCTION.....: In a reproduction study, cyfluthrin was administered to rats for 3 generations at dietary concentrations of 50, 150 and 450 ppm. Reproductive effects observed at parentally toxic levels included reductions in viability, lactation, litter size, feed consumption, and pup birth weights and body weight gains. Coarse tremors were observed in some offspring at 450 ppm. The NOEL for both parental and reproductive effects was 50 ppm. In another reproduction study, cyfluthrin was administered to rats for 2 generations at dietary concentrations of 50, 125 or 400 ppm. Coarse tremors occurring in conjunction with parental toxicity were observed in the offspring in the mid- and high-dose groups. Based on this finding, the neonatal NOEL was 50 ppm. The NOELs for parental and reproductive toxicity were 50 and 400 ppm, respectively.

NEUROTOXICITY .....: Numerous neurotoxicity studies have been conducted on cyfluthrin. Oral gavage studies using hens have indicated that at extremely high dose levels (5000 mg/kg), minimal nerve damage occurs. When rats were administered cyfluthrin daily at oral doses of 40 to 80 mg/kg for 14 days, minimal nerve effects were seen. These effects were completely reversible within a 3 month recovery period. In dermal and inhalation studies which are more relevant to field exposure, there was no evidence of delayed neurotoxicity in hens. In a special investigative study, litters of neonatal mice (10 days of age) and their mothers were exposed to cyfluthrin via inhalation (whole body exposure). Mice were exposed to aerosol concentrations of 5, 15, or 50 mg/kg for 6.3 hours/day for 7 successive days. Motor activity was measured in the offspring at 4 months of age (approximately 3.5 months post-exposure). At 50 mg/m3, all of the offsprings died or were sacrificed in a moribund state following the first exposure. Mortalities were not observed at any of the other levels. Clinical symptoms were observed immediately after exposure in young mice at 15 mg/m3, and included decreased motility, temporary

scratching, and tonic convulsions. There was an increase in motor activity in mice at 15 mg/m3. Histopathological investigations did not reveal any treatment-related findings in mice at the age of 4 months.

12. ECOLOGICAL INFORMATION:

This product is toxic to fish. Bayer will provide a summary of specific data upon written request. As with any pesticide, this product should be used according to label directions and should be kept out of streams, lakes and other aquatic habitats of concern.

13. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD.....: Follow container label instructions for disposal of wastes generated during use in compliance with the FIFRA product label. In other situations, bury in an EPA-approved landfill or burn in an incinerator approved for pesticide destruction. Do not reuse container.

14. TRANSPORTATION INFORMATION:

TECHNICAL SHIPPING NAME.....: Cyfluthrin
FREIGHT CLASS BULK.....: Insecticides, NOI - NMFC 102120
FREIGHT CLASS PACKAGE.....: Insecticides, NOI - NMFC 102120
PRODUCT LABEL.....: Not Noted

DOT (DOMESTIC SURFACE)

PROPER SHIPPING NAME.....: Not regulated
HAZARD CLASS OR DIVISION .....: Non-Regulated

IMO / IMDG CODE (OCEAN)

PROPER SHIPPING NAME.....: Not Regulated
HAZARD CLASS DIVISION NUMBER...: Non-Regulated

ICAO / IATA (AIR)

PROPER SHIPPING NAME.....: Not Regulated
HAZARD CLASS DIVISION NUMBER...: Non-Regulated

15. REGULATORY INFORMATION:

OSHA STATUS.....: This product is hazardous under the criteria of the Federal OSHA Hazard Communication Standard 29 CFR 1910.1200.

TSCA STATUS.....: This product is exempt from TSCA Regulation under FIFRA Section 3 (2)(B)(ii) when used as a pesticide.

CERCLA REPORTABLE QUANTITY..: No components listed.

SARA TITLE III:

SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES..: No components listed.

SECTION 311/312 HAZARD CATEGORIES.....: Immediate Health Hazard

SECTION 313 TOXIC CHEMICALS.....: Cyfluthrin - CAS # 68359-37-5 (0.1%)

RCRA STATUS.....: If discarded in its purchased form, this product would not be a hazardous waste either by listing or by characteristic. However, under RCRA, it is the responsibility of the product user to determine at the time of disposal, whether a material containing the product or derived from the product should be classified as a hazardous waste. (40 CFR 261.20-24)

16. OTHER INFORMATION:

NFPA 704M RATINGS:	Health	Flammability	Reactivity	Other
	1	1	0	

0=Insignificant 1=Slight 2=Moderate 3=High 4=Extreme

Bayer's method of hazard communication is comprised of Product Labels and Material Safety Data Sheets. NFPA ratings are provided by Bayer as a customer service.

REASON FOR ISSUE.....: Revise Product Name
PREPARED BY.....: V. C. Standart
APPROVED BY.....: D. C. Eberhart
TITLE.....: Product Safety Manager
APPROVAL DATE.....: 10/29/2001
SUPERSEDES DATE.....: 06/15/2001
MSDS NUMBER.....: 37745

This information is furnished without warranty, expressed or implied, except that it is accurate to the best knowledge of Bayer Corporation. The data on this sheet relates only to the specific material designated herein. Bayer Corporation assumes no legal responsibility for use or reliance upon these data.
